1. The distance between two points A and B on a plan was found to be 100m when measured with a scale with R.F. of $\frac{1}{1000}$. The distance between the same points when measured with a scale with RF of $\frac{1}{500}$ will be :

(a) 200m

(b) 50 m

(c) 2500m

(d) None of the above

2. If the hypotenuse allowance for a ground A for a 20m chain and for ground B for 30m chain is the same. The ratio of the gradient of ground A to that of ground B is

(a) 1.0 (b) 1.1

(c) 1.22 (d) 1.4

3. Which of the following methods results in higher accuracy for measuring horizontal distances on rough grounds.

(a) Chaining (b) Taping

(c) Contouring (d) Tacheometry

4. The bearings of 2 inaccessible stations S_1 (Easting 400m, Northing 500m) and S_2 (Easting 600m, Northing 550m) from a station S_3 were obtained as 240^0 and 160^0 respectively. The independent northing (in m) of station S_3 is .....

Linked Question 5 and 6

The following readings refer to the reciprocal level taken between two stations P and Q

Instrument at	Staff P	Reading at Q
P	1.425	2.724
Q	1.429	2.504

5. The true difference in elevation is…..... m

6. If the instrument has collimation error of 0.003/150m and the distance between the stations was 1150 m, then the error due to refraction will be.....m

7. The area of the plan of an old survey plotted to a scale of 5m to 1 cm now measures 90cm^2 as found by plan meter. The plan is found to have shrunk so that original line of 15cm length now measures only 14.5 cm. A note on the plan also states that the 30m chain used was 10 cm too long then the true field area of survey will be…..... m^2

8. If (n-1) divisions on the main scale are equal in length to n divisions on the vernier scale then least count is : (S is the length of 1 main scale

division) :

(a) $S/_{2n}$

(b) $2S/_{n}$

(c) $S/_{n}$

(d) None of the above

9. While operating a theodolite, the operation of bringing the vertical circle to the right of observer, if originally it is to the left and vice versa is called as

(a) Swinging (b) Transiting

(c) Changing face (d) Centering

10. Normal pull is the pull which

(a) is used at the time of standardizing the tape

(b) makes the correction due to sag equal to zero

(c) makes the correction due to pull equal to zero

(d) neutralizes the effect due to sag

11. The whole circle bearing of side AB of an equilateral triangle ABC is $38^0 45'$, then the bearing of the third side CA of the triangle is :

(a) $98^0 45'$ (b) $81^0 15'$

(c) $197^0 30'$ (d) $278^0 45'$

Linked Question 12 and 13

A vertical curve lies between two gradients of 0.6% and -0.9%. Rate of change of gradient of the curve is 0.075% per 30 m. If the elevation and chainage of the point of intersection are 1430m and 985.5m respectively then :

12. A line was measured with a steel tape which was exactly 30m at 20^0C at a pull of 100N. The measured length was 1500m. If temperature during measurement was 40^0C and the pull applied was 150N, determine the correct length of line.

Cross sectional area of tape = $2.5mm^2$

Coefficient of Expansion

$= 3.5\times10^{-6}$ per ^{0}c

Modules of Elasticity = $2.1\times10^5 N/mm^2$

(a) 1499.752 m (b) 1500.248 m

(c) 1499.857 m (d) 1500.143 m

13. If the standard error in length of square 1m×1m is ± 0.1 cm, the standard error of area will be :

(a) $\pm10cm^2$

(b) $\pm20cm^2$

(c) $\pm14.14cm^2$

(d) None of the above

14. The most probable value of angle A from the following equations will be……. degrees.

A - 40^0, weight = 2

2A - 81^0, weight = 5

15. The sides of the rectangle are (60 ± 0.05m) and (120 ± 0.03 m). The probable error in area will be :

(a) ±10.8 m^2 (b) ±7.8015 m^2

(c) ±4.2015 m^2 (d) ±6.25 m^2

16. The number of photographs (size 250 × 250 mm) required to cover the area of 20km × 16km if the longitudinal overlap is 60% and side overlap is 30% will be..... .

Scale of photograph is 1cm=150m

17. A and B are 2 points on the opposite banks of a river along a chain line CAB which crosses the river at right angles. The surveyor selects a point D which is 60m from A along the bank and sets a perpendicular CD on the line BD. If the distance CA is 70.5m, determine the distance AB.

(a) 51.06 m (b) 70.5 m

(c) 92.57 m (d) 102.7 m

18. The vertical angle between the longitudinal axis of a freely suspended magnetic needle and the horizontal line is called :

(a) Declination

(b) Dip

(c) Azimuth

(d) None of the above

Linked Question 19 and 20

In traverse the following lengths and bearings were measured :

Side	Length (m)	Bearing
AB	130	N $38^0$42' W
BC	180	N $45^0$30' E
CD	163	N $62^0$30' E
DE	265.65	-----
EA	-----	S $75^0$00' W

19. Length of EA will be.....m

20. WCB of DE will be.....degrees.

21. In testing a dumpy level, following observation were recorded ;

Instrument Location	Reading at A	Reading at B
Midway between A and B	2.615	3.175
Between A and B at 25m from A and 75 m from B	1.905	2.340

The tan of angle of inclination of

the line of collimation will be…..

22. Determine the sag correction for a 30 m steel tape under a pull of 100N in 3 bays of 10m each. The area of cross-section of the tape is $8mm^2$ and unit weight of steel may be taken as 77 kN/m^3.

(a) 4.74×10^{-3} m (b) -4.74×10^{-3} m

(c) 1.58×10^{-3} m (d) -1.58×10^{-3} m

23. A survey line was measured to be 100 m. It was found that there was misalignment and the line was 1m off the straight line at the middle. Determine the correct length.

(a) -0.02 m (b) + 0.02m

(c) -0.03m (d) +0.03m

24. The fore bearing and back bearing of Line PQ were observed to be 205^0 30' and 24^0 0' respectively. It was known that station Q was free from local attraction. If the bearing of sun was observed from station P at local noon is 358^0 00'. The true bearing of line PQ will be.....

25. If the staff intercept on a staff located at 100m from the level for five divisions deviation of the bubble is 0.050 m and if the length of one division of the bubble is 2mm, then the radius of curvature of the bubble tube is :

(a) 2.02 m (b) 2.20 m

(c) 20.00 m (d) 20.20 m

26. The distance between 2 bench marks is 1000m, if during leveling, the total error due to collimation, curvature and refraction is found to be +0.120m, then the magnitude of the collimation error is :

(a) 0.00527 m (b) 0.0527 m

(c) 0.527 m (d) 0.673 m

27. A dumpy level is setup with its eye-piece vertically over a peg A. The height from the top of peg A to the centre of the eye-piece is 1.540m and the reading on peg B is 0.705m. The level is then setup over peg B. The height of the eye-piece above peg B is 1.490m and the reading on A is 2.195m. The difference in level between A and B is. :

(a) 2.900 m (b) 3.030 m

(c) 0.770 m (d) 0.785 m

28. A theodolite was set up in between two towers X and Y. The distance of the theodolite station from X is 60m and from Y is 120m. Observations were taken from the theodolite to the top of tower X and Y and were recorded as $33^0$26'20" and $30^0$50'40" respectively, telescope focused upward for both cases.

The RL of the trunion axis of the

theodolite was 139.675m above mean sea level. Calculate the R.L. of the top of the tower X.

29. The error in Linear and angular measurements for a line of length ℓ are respectively C_1 and C_2. The Bowdichs principle for adjusting traverse corresponds to :

(a) $C_1 \mu \frac{1}{\sqrt{\ell}}$ and $C_2 \mu \sqrt{\ell}$

(b) $C_1 \mu \sqrt{\ell}$ and $C_2 \mu \frac{1}{\sqrt{\ell}}$

(c) $C_1 \mu \sqrt{\ell}$ and $C_2 \mu \sqrt{\ell}$

(d) $C_1 \mu \frac{1}{\sqrt{\ell}}$ and $C_2 \mu \frac{1}{\sqrt{\ell}}$

30. The Gale method of traversing consists of plotting the points by :

(a) Independent coordinates

(b) Consecutive coordinates

(c) Both (a) and (b)

(d) Chords

31. In traversing, Linear measurements are done with chain and angular measurements by :

(a) Chain

(b) Compass

(c) Theodolite

(d) Any of the above instruments

32. The length and bearings of a closed traverse PQRSP are given below :

Line	Length (m)	Bearing (WCB)
PQ	200	0^0
QR	1000	45^0
RS	907	180^0
SP	?	?

The missing length and bearing, respectively of the line SP are :

(a) 207 m and 270^0

(b) 707 m and 270^0

(c) 707 m and 180^0

(d) 907 m and 270^0

33. The co-ordinations of two points A and B are as follows :

Point	Coordinates	
	N	E
A	481.5	324.2
B	607.6	75.4

Calculate the bearing of Line AB

(a) N $63^0$7'W (b) S $63^0$7'E

(c) N $116^0$53'W (d) S $116^0$53'E

34. The volume of earthwork was computed to be 5000m^3 when measured with a tape of 30m nominal length. If the tape was 0.10m long, determine the correct volume.

35. Invar tape is made of an alloy of :

(a) Copper and Steel

(b) Brass and Nickel

(c) Brass and Steel

(d) Steel and Nickel

36. During chaining along a straight line with a 20m chain, the leader of the party has 4 arrows in his hand which the follower has 6. Distance of the follower from the starting point is :

(a) 4 Chains (b) 6 Chains

(c) 8 Chains (d) 12 Chains

37. The following bearing were taken in running closed compass traverse AB CD A

Line	FB	BB
AB	$124^0 30'$	$304^0 30'$
BC	$68^0 15'$	$246^0 0'$
CD	$310^0 30'$	$135^0 15'$
DA	$200^0 15'$	$17^0 45'$

One would suspect local attraction at stations :

(a) A and B (b) B and C

(c) C and D (d) D and A

38. ABCD is a regular parallelogram plot of land, whose angle BAD is 60^0. If the bearing of the line AB is 30^0, then the bearing of the line CD is :

(a) 90^0 (b) 120^0

(c) 210^0 (d) 270^0

39. The observed magnetic bearing of line OE was found to be 185^0. It was later discovered that station 0 had a local attraction of $+1.5^0$. The true bearing of line 0E, considering a magnetic declination of 3.5^0E shall be :

(a) 180^0 (b) 187^0

(c) 190^0 (d) 193^0

40. A sailor standing on the deck of a ship, just sees the light beam from a light house on the shore. If the height of the sailor's eye and of the light beam at the light house, above the sea level are 9m and 25m respectively, what is the distance between the sailor and light house?

(a) 29.8 km (b) 31.1 km

(c) 31.9 km (d) 33.2 km